REMARKS

Applicants respectfully request the Examiner to reconsider the present application in view of the foregoing amendments to the claims and the following remarks.

Status of the Claims

Claims 1-6 and 12-15 are currently pending in the present application. The Office Action is non-final. Claims 7-11 are withdrawn from consideration as being directed to a non-elected invention. Claims 1, 7 and 11 have been amended without prejudice or disclaimer of the subject matter contained therein. No new matter has been added by way of the amendments. Support for amended claims 1, 7 and 11 can be found at page 5, lines 26-27, and page 13, line 27 of the present specification. Thus, no new matter has been added.

Based upon the above considerations, entry of the present Amendment is respectfully requested.

Issue Under 35 U.S.C. § 102(b), Anticipation

Claims 1-6, and 12-15 stand rejected under 35 U.S.C. § 102(b) as anticipated by Nakayama *et al.*, "*Preparation of α-Quinque- and α-Septithiophenes and their Positional Isomers*," Heterocycles, Vol. 26, No. 4, pp. 939-942 (1987) (hereinafter "Nakayama"). The Examiner asserts that Nakayama discloses the compounds of the present invention as electroconductors. The Examiner further suggests that using the compounds in charge transport films and varnish is inherent in their property as electroconductors. Additionally, the Examiner

asserts that that the intended use is not a limitation of a compound or product. Applicants respectfully traverse.

Although Applicants do not agree with the Examiner's assertions, in order to advance prosecution, claim 1 has been amended, without prejudice or disclaimer, so that q represents an integer of 1 or over.

Applicants submit that Nakayama discloses doped polythiophenes as electroconductors. However, Nakayama fails to teach that a compound having a 1,4-dithiin ring serves as an electroconductor. That is, the compounds 8 and 12 disclosed in Nakayama are merely intermediates for synthesis of quinque- and septithiophenes, which show photoenhanced activity against organisms such as nematodes.

With regards to the compounds of the present invention, in spite of relatively short recurring units, the inventive compounds having a 1,4-dithiin ring have good conductivity so that an organic electroluminescent (EL) element having a film containing the compound has low drive voltage and high luminous efficiency.

Nakayama fails to teach conductivity of a compound having a 1,4-dithiin ring which has a relatively short recurring unit. Further, Applicants note that thiophene oligomers having more than four subunits are insoluble in most solvents. Applicants submit that the compounds of the present invention have good solubility properties. When they are within a varnish, they can be employed by use of an organic solvent alone. Since Nakyama is silent regarding a compound having a 1,4-dithiin ring serving as an electron conductor, and is silent concerning conductivity of a compound having a 1,4-dithiin ring which has a relatively short recurring unit, Nakayama does not teach the present invention.

Because "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," the cited Nakayama reference cannot be a basis for a rejection under § 102(b). *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Accordingly, Nakayama fails to teach the inventive charge transport organic material comprising the compound having a 1,4-dithiin ring. Applicants respectfully request reconsideration and withdrawal of the present rejection.

Issue Under 35 U.S.C. § 103(a), Obviousness

Claims 4-6, and 13-15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Nakayama.

The Examiner asserts that Nakayama discloses the instant compounds as electroconductors and that the difference between the instant invention and that of Nakayama is that Applicants are using the compounds as charge transporters in film and varnish while Nakayama teaches that the compounds are electroconductors.

Further, the Examiner asserts that using compounds of the present invention within charge transport films or varnish is an inherent property since they are electroconductors. The choice of using them in film or varnish is an obvious modification available to the preference of an artisan. Applicants respectfully traverse.

Graham v. John Deere, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), has provided the controlling framework for an obviousness analysis. A proper analysis under § 103(a) requires consideration of the four *Graham* factors of: determining the scope and content of the prior art;

ascertaining the differences between the prior art and the claims that are at issue; resolving the level of ordinary skill in the pertinent art; and evaluating any evidence of secondary considerations (e.g., commercial success; unexpected results). 383 U.S. at 17, 148 USPQ at 467.

M.P.E.P. § 2143 sets forth the guidelines in determining obviousness. But before the Examiner can utilize these guidelines, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*; *supra*. To reject a claim based on the above mentioned guidelines, the Examiner must resolve the *Graham* factual inquiries. MPEP §2143.

If the Examiner resolves the *Graham* factual inquiries, then the Examiner has to provide some rationale for determining obviousness, wherein M.P.E.P. § 2143 sets forth the rationales that were established in *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

Applicants respectfully submit that the Examiner has not appropriately resolved the *Graham* factors, including the factors of determining the scope and content of the prior art and ascertaining the differences between the prior art and the claims that are at issue. Based on the following, Applicants maintain that the above mentioned *Graham* factors actually reside in Applicants' favor. Additionally, Applicants submit that since the Examiner did not resolve the *Graham* factors, the rationale the Examiner provides for combining the cited references is improper.

Applicants respectfully submit that the presently claimed invention is distinct from and unobvious over Nakayama.

The instant invention

The present invention relates to compounds having a 1,4-dithiin ring, which are soluble in an organic solvent such as N,N-dimethylformamide (hereinafter abbreviated as DMF), and are able to develop charge transportability when used in combination with an electron accepting dopant substance or hole accepting dopant. This enables one to attain low voltage drive and an improved luminous efficiency when used as a charge transporting thin film such as a hole injection layer of a low-molecular-weight organic EL (OLED) element.

A charge transporting thin film obtained from varnish containing a charge transport organic material according to the present invention is formed on the surface of an electrode. When this film is used as a charge injection layer of an organic EL element, a charge injection barrier between the electrode and the organic layer lowers, thereby ensuring a lowering of drive voltage and an improved luminous efficiency.

With regards to the compounds of the present invention, in spite of relatively short recurring units, the inventive compounds having a 1,4-dithiin ring have good conductivity so that an organic electroluminescent (EL) element having a film containing the compound has low drive voltage and high luminous efficiency. Although the compounds of the present invention have relatively short recurring units, the inventive compound still have good solubility properties, so that the varnish containing the compound can be employed by use of an organic solvent alone. This is important since for use as hole transport materials of polymer organic EL (PLED) elements, there are demand characteristics such as high charge transportability, insolubility in solvents for light-emitting polymers, appropriate ionization potentials, *etc.* Polyaniline-type and polythiophene-type materials, which have been frequently employed, have

problems in that they contain, as a solvent, water, which has the possibility of facilitating element degradation. Additionally, if the compounds are so low in solubility, a selection of solvents is limited since material coagulation is liable to occur. This in turn, also limits how uniform film formation can be performed.

Differences between the invention and the prior art

In contrast, Nakayama discloses doped polythiophenes as electroconductors, which, according to Nakayama, are α-terthiophenes that show photo-enhanced properties against a wide variety of organisms, particularly nematodes. However, Nakayama fails to teach that a compound having a 1,4-dithiin ring serves as an electroconductor. That is, the Nakayama compounds 8 and 12 are merely intermediates for synthesizing α-quinque- and α-septithiophenes which been shown to show activity against organisms such as nematodes. Nakayama also fails to teach a conductivity of a compound having a 1,4-dithiin ring which has a relatively short recurring unit.

Further, Applicants note that thiophene oligomers having more than four subunits are insoluble in most solvents. Having more than four subunits runs counter to the present invention since the compounds of the present invention show good solubility properties so that the varnish containing the compounds can be employed with the organic solvent alone, and thus avoid potential element degradation issues or material coagulation.

Applicants submit that as described above, there are differences between the present invention and Nakayama that indicate that the Examiner has not appropriately resolved the *Graham* factors.

Applicants respectfully disagree with the Examiner that the present invention would be obvious to the skilled artisan. In view of the above, it submitted that the present invention as claimed is suitably distinguished over the Nakayama.

In light of the above presently amended claims and remarks, because there is no disclosure, teaching, suggestion, reason or rationale provided in Nakayama that would allow one of ordinary skill in the art to arrive at the instant invention as claimed, it follows that Nakayama is incapable of rendering the instant invention obvious under the provisions of 35 USC § 103(a). Based upon the above, and applying the *Graham factors* analysis test, it is submitted that a *prima facie* case of obviousness has not been established.

Applicants respectfully request reconsideration and withdrawal of the present rejection.

CONCLUSION

A full and complete response has been made to all issues as cited in the Office Action. Applicants have taken substantial steps in efforts to advance prosecution of the present application. Thus, Applicants respectfully request that a timely Notice of Allowance issue for the present case.

In view of the above remarks, it is believed that claims are allowable.

Should there be any outstanding matters within the present application that need to be resolved, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Reg. No. 43,575, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated: FEB 19 2009

Respectfully submitted,

By _____

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